

EXHIBIT 9



Political Science

School of Public & International Affairs

UNIVERSITY OF GEORGIA

GEORGIA VOTER VERIFICATION STUDY

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[DRAFT VERSION 1.0]

AUDREY A. HAYNES

(polaah@uga.edu)

M.V. HOOD III

(th@uga.edu)

**Exhibit
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I. Study Objective

In 2019, the State of Georgia made the decision to replace its aged direct-recording electrical (DRE) voting system with a new system produced by Dominion Voting Systems that would be utilized across the state.¹ For in-person voting (early or on election-day) this new voting system provided ballot marking that was electronic but also provided a paper ballot output. Voters make selections on a touch-screen and may review their selections before printing a paper ballot from a printer attached to the ballot marking device. The printed ballots contain a QR code that can be scanned and also displays in printed words all the selections made by the voter. Before leaving the voting booth, voters are encouraged to review the choices on their printed ballot and, if there are discrepancies, they may spoil their ballot and vote again. When ready, voters physically take their printed ballot and insert it into a ballot tabulator. At this point the ballot is officially recorded as being cast and the paper ballot is secured within the tabulator.

The statewide rollout for the new system was to have taken place during the 2020 presidential preference primary. Due to the Covid-19 pandemic, this primary was canceled and rescheduled to coincide with the May statewide primary election. Almost half of primary voters in May voted absentee by mail and, consequently, did not have any interaction with the new system. For these reasons, our study was delayed until the 2020 general election.

The purpose of the study is to examine the interaction of Georgia voters with the new ballot marking system. More specifically, we are seeking to determine if voters check the choices registered on their paper ballot before depositing (casting) them in the tabulator.

II. Study Design

In order to study the interaction of Georgia voters with the new Dominion ballot marking voting system we recruited University of Georgia students to act as field observers at various precinct locations. Student observers were compensated and were required to attend a one-hour in-person training session. Seventy-four observers were assigned a precinct location and worked a six-hour shift, either 7:00 am to 1:00 pm or 1:00 pm to 7:00 pm on election-day (November 5, 2020).²

Students were trained to record various observations related to voters and voter-interaction at their assigned precinct. All observers used a common observation sheet [a copy of the observation sheet is attached to this report]. Students were instructed to collect specific observations for each voter including the time they entered the voting booth and the time they completed the process. Basic demographic information was also collected using the following categories:

- Age [Young, Middle, Older]³
- Sex [Male, Female, Unsure]
- Race [White, Black, Hispanic, Asian, Unsure]

At the voting booth, observers were to record whether the voter checked/reviewed the choices on their printed ballot and, if so, the approximate amount of time they spent in this process.

¹Dominion ImageCast x Prime Ballot Marking Device (Version 5.5.10.30).

²These students were given credential letters from the Secretary of State's Office and worked with poll managers to optimize their observations while also maintaining all rules governing public safety protocols and voter privacy.

³Observers were instructed to use the following age ranges as approximations for these categories: Young (18-29); Middle (30-54); and Older (55+).

Observers were trained to mentally note the number of seconds the voter examined their paper ballot using the following categories:

- Brief Glance (Less than one second)
- Short Time (One to five seconds)
- Long Time (More than five seconds)

Students were also instructed to observe voter behavior at the tabulator where a precinct official was stationed. Per instructions issued from the Secretary of State's Office, these polling place officials were to oversee the process of voters inserting their ballots into the tabulator. They were also asked to remind voters to check the choices on their ballot before casting it, if they wished. At this stage of the process student observers recorded whether or not the precinct worker instructed the voter to check their ballot and, second, if the voter was provided instructions on how to cast their ballot using the tabulator. We also recorded whether or not the voter checked over their ballot while waiting to insert it into the tabulator.

Thirty-one precincts were selected at random from the following counties: Clarke (17), Oconee (5), Oglethorpe (2), Madison (2), Jackson (1), and Barrow (5).⁴ These six counties are comprised of the City of Athens (Clarke) and the immediate geographically proximate counties. In order to assure racial/ethnic diversity among these counties, a stratified random sample of thirty precincts was randomly selected from the 44 precincts that are majority non-Hispanic white in composition.⁵ A further three precincts were randomly selected from the group of five majority-minority precincts. In addition, a random sample of seven precincts was also drawn from Gwinnett County. Gwinnett County is part of the Atlanta metro area. Of these, six were majority-minority and one was majority non-Hispanic white [A list of precincts where observations were taken is appended to this report].

This study also included an embedded experiment where voters at four randomly selected precincts were given a paper reminder (see below) to check their ballot after printing.⁶ The reminder was patterned directly on a public relations campaign from the Secretary of State's Office. Upon completion of the observational study, we can compare voters at treatment (received reminder) and control precincts (did not receive reminder) in order to determine if handing individuals a reminder will produce any perceivable effect on voter behavior.

⁴In order to ensure a steady stream of observations precincts with fewer than 2,000 registrants were not considered for random selection.

⁵Race/ethnicity of registrants is recorded in Georgia. Precinct racial composition was obtained from the Georgia Secretary of State.

⁶The four precincts where voters received a reminder are as follows: Covenant Life Sanctuary (4)-Barrow County; Judia J. Harris Elementary School (2A)-Clarke County; Athens Transit Multi-Modal Center (4A)-Clarke County; and Bishop Baptist Church (4&5)-Oconee County.



After printing your paper ballot,
REVIEW your choices
to make sure they are correct.

III. Analysis and Findings

Following the general election, observation sheets were collected and data were entered digitally in preparation for analysis. In total, there were 4,024 usable observations. The following discussion of findings relies on the aforementioned observation data.

Voter Behavior at the Voting Booth

This section discusses the behavior of voters at the voting booth after printing their paper ballot. The results of our analysis indicate that 80.1% of the voters observed checked their ballot, compared to a fifth (19.9%) who did not.

Given that some voters in the *brief glance* category only undertook a very cursory examination of their ballot, a fairer assessment on the question of whether voters checked the choices on their paper ballot is found in Table 1. Here we see that just under a third of the voters observed (31.3%) only glanced at their ballot after printing it.

Combining this group with those who failed to look at their ballot at all, we see that more than half (51.3%) of voters undertook an insufficient check of their ballot from the standpoint of being able to adequately determine if their choices had been correctly documented on the paper ballot. On the other hand, approximately half (48.7%) the voters observed did spend at least some time examining their ballot. Approximately three of ten voters (29.9%) spent a short time looking over the choices on their paper ballot, while close to one-fifth (18.8%) spent a longer period of time examining their ballot.

Table 1. Voter Behavior Observed at the Voting Booth

Category	Percentage
Did not check	20.0%
Brief glance	31.3%
Short time	29.9%
Long time	18.8%

Voter Behavior at the Tabulator

In this section we examine voter behavior as voters moved from the voting booth to deposit their ballot in the tabulator.⁷ At this stage of the process, student observers recorded that 23.8% of voters were instructed to check their ballot by precinct workers. This would appear far short of the goal set by the Secretary of S that all voters be informed at this stage in the process that they should examine the choices on their paper ballot before casting it. On the other hand, almost all voters (86.7%) were given instructions by precinct workers on inserting their ballot into the tabulator.

Of the cases where observers were able to hear voters being instructed to check their ballots, 62.3% did so at this point in the voting process, while 37.7% did not. This 62%, however, equates to only 14.2% of the total number of voters observed in the study. Most voters then did not check their ballot at this stage in the voting process.⁸ Of those voters who did check over their ballots before the tabulator, 85.7% had also been recorded as having done so at the voting booth. (85.7%). Only 80 voters, or 2.0% of the total number of voters observed, checked their ballots at the tabulator stage having not done so at the voting booth.

Voter Behavior and Demographics

In this section we will discuss the demographic breakdown of the voters in our observation study, and how our primary observation of interest (checking one's ballot at the voting booth) varied by demographic category. The breakdown of race, sex, and age for the observation set is detailed in Table 2 below.

⁷Student observers were instructed to position themselves at the precinct where they could observe voter behavior both at the voting booth as well as the tabulator. In some locations, this was difficult to achieve and, as a consequence, it was not possible to always track voter behavior at the tabulator. The results presented in this section are based on the data that are available.

⁸It should be noted that in most precincts it was a very short distance from voting booths to the tabulator. Those voters who did check their ballot in the voting booth, therefore, may have opted out of checking their ballot again only seconds later.

Table 2. Demographic Breakdown of Voters Observed

	Percentage
Race:	
White	67.4%
Black	21.9%
Hispanic	5.9%
Asian	2.9%
Unknown	1.9%
Sex:	
Male	49.4%
Female	50.2%
Unknown	0.4%
Age:	
Young	37.1%
Middle	42.9%
Older	18.4%
Unknown	1.6%

Next, we provide a series of contingency tables in order to determine if the decision of voters to check their ballot at the voting booth varied by race, sex, and age.⁹ For the contingency tables presented, we collapse the *Did not check* and *Brief glance* categories into a single category and the *Short time* and *Long time* categories into a single category. Looking at Table 3, white voters were slightly more likely to have checked their ballot as compared to minority voters. The difference between white and black voters on this metric is 6.0 points (50.5% of white voters were recorded as having checked their ballot versus 44.5% of black voters). The difference between white and Hispanic voters is 4.9 points and for Asian voters it is 6.2 points. The distribution of voters who checked their ballot across racial categories in Table 3 is statistically significant, an indication the denoted pattern is not due to random chance.

Table 3. Voter Behavior by Race

Category	White	Black	Hispanic	Asian
Did not check/glance	49.5%	55.5%	54.4%	55.7%
Short/long time	50.5%	44.5%	45.6%	44.3%

Notes: Entries are column percentages. Chi-square: 11.35 (p<.01)

Table 4 displays the same information by Sex. Here we see a bare majority (50.5%) of male voters checked over their ballots at the voting booth compared to 46.6% of female voters. The difference between these two groups, at 3.9 points, is statistically significant.

⁹Voters who could not be classified by observers (unknown) are excluded from these analyses.

Table 4. Voter Behavior by Sex

Category	Male	Female
Did not check/glance	49.5%	53.4%
Short/long time	50.5%	46.6%

Notes: Entries are column percentages. Chi-square: 5.90 ($p < .05$)

Finally, Table 5 examines the results by age category. Here we see that the likelihood of checking one's ballot at the voting booth is positively associated with age. Less than a majority of younger voters (45.3%) were observed checking their ballots, compared with 49.2% of middle-aged voters, and 53.2% of older voters. The difference between younger and older voters is 7.9 points. The distribution of responses presented in Table 5 across age categories is statistically significant.

Table 5. Voter Behavior by Age

Category	Young	Middle	Older
Did not check/glance	54.7%	50.8%	46.8%
Short/long time	45.3%	49.2%	53.2%

Notes: Entries are column percentages. Chi-square: 12.67 ($p < .01$)

To summarize, the profile of a voter who checked their ballot at the voting booth was associated by demographic characteristics. White voters, male voters, and older voters were all more likely to have spent time checking their paper ballots after printing.

Embedded Experiment

Table 6 below compares the behavior of voters in the treatment and control precincts based on whether they checked their ballot at the voter booth after printing. There were a total of 511 voter observations recorded at the four treatment precincts, or 13.1% of all observations. Those voters in precincts that received a reminder (treatment) were 5.3 points more likely to have checked their ballot as compared to voters that did not receive a reminder (control), 53.2% versus 47.9% respectively. Although five points is a modest increase, the difference between the treatment and control groups is statistically significant.¹⁰ Translated into English, the simple act of giving voters a paper reminder at the check-in table increases the likelihood that they will check over their ballot after printing.

Table 6. Results of Embedded Experiment

Category	Treatment	Control
Did not check/glance	46.8%	52.1%
Short/long time	53.2%	47.9%

Notes: Entries are column percentages.

¹⁰Mean difference: -0.528; $t = -2.228$; $p < .05$.

IV. Conclusion

On election-day for the 2020 general, a largescale observational study was undertaken in north Georgia to study the interaction of voters with the state's new ballot marking system. More specifically, we were tasked with observing whether or not voters checked to confirm the choices on their paper ballot after printing. Using an objective measure, we found that half of the voters observed spent some or a long period of time checking over their paper ballot. If voters did check their paper ballot, it was at the voting booth, immediately after printing out their ballot. Few voters rechecked their ballots at the tabulator and almost no voters checked their ballot for the first time at the tabulator stage in the process. This finding may, in part, be due to the fact that poll workers stationed at the tabulator did not consistently appear to be reminding voters to do so, focused instead on the process of inserting the ballot correctly and explaining the process to the voter. These same poll workers did, however, adequately instruct almost all voters on how to cast their ballot at the tabulator. Providing voters a reminder of their ability to confirm their choices on the paper ballot at the tabulator stage should be reemphasized during precinct poll worker training. Distinctive demographic characteristics based on age, sex, and race were noted for voters who checked their ballot at the voting booth. Finally, the results of our embedded experiment demonstrate that handing out a simple reminder to voters can act to modify voter behavior—in this case modestly increasing the probability they will check their ballot choices after printing.

Appendix A: Observation Sheet

GEORGIA VOTING BEHAVIOR CODE SHEET

Coder name: _____

Date: _____ Start Time: _____ County: _____ Precinct: _____ Assigned Voter Booths: _____

Start Time/ Stop Time	Sex	Race	Age	Voter Behavior at Voting Booth	Length of check [in seconds]	Voter Behavior at Tabulator [Check all that apply]	Other Observations: [Required poll worker assistance at voting booth; requested new ballot, etc.]
	Male Female Unsure	White Black Hispanic Asian Unsure	Young [18-29] Middle [30-54] Older [55+] Unsure	Checked ballot Did not check Unsure	Brief glance <1 Short time 1-5 Long time >5 Unsure	<input type="checkbox"/> Instructed to check ballot <input type="checkbox"/> Checked ballot <input type="checkbox"/> Did not check ballot <input type="checkbox"/> Instructed to insert ballot Other obs. [note in next column]	
	Male Female Unsure	White Black Hispanic Asian Unsure	Young [18-29] Middle [30-54] Older [55+] Unsure	Checked ballot Did not check Unsure	Brief glance <1 Short time 1-5 Long time >5 Unsure	<input type="checkbox"/> Instructed to check ballot <input type="checkbox"/> Checked ballot <input type="checkbox"/> Did not check ballot <input type="checkbox"/> Instructed to insert ballot Other obs. [note in next column]	
	Male Female Unsure	White Black Hispanic Asian Unsure	Young [18-29] Middle [30-54] Older [55+] Unsure	Checked ballot Did not check Unsure	Brief glance <1 Short time 1-5 Long time >5 Unsure	<input type="checkbox"/> Instructed to check ballot <input type="checkbox"/> Checked ballot <input type="checkbox"/> Did not check ballot <input type="checkbox"/> Instructed to insert ballot Other obs. [note in next column]	
	Male Female Unsure	White Black Hispanic Asian Unsure	Young [18-29] Middle [30-54] Older [55+] Unsure	Checked ballot Did not check Unsure	Brief glance <1 Short time 1-5 Long time >5 Unsure	<input type="checkbox"/> Instructed to check ballot <input type="checkbox"/> Checked ballot <input type="checkbox"/> Did not check ballot <input type="checkbox"/> Instructed to insert ballot Other obs. [note in next column]	
	Male Female Unsure	White Black Hispanic Asian Unsure	Young [18-29] Middle [30-54] Older [55+] Unsure	Checked ballot Did not check Unsure	Brief glance <1 Short time 1-5 Long time >5 Unsure	<input type="checkbox"/> Instructed to check ballot <input type="checkbox"/> Checked ballot <input type="checkbox"/> Did not check ballot <input type="checkbox"/> Instructed to insert ballot Other obs. [note in next column]	

Appendix B: Precincts Included in Study

County	Precinct ID	Polling Place	Address	Observer	Shift
BARROW	1	BETHLEHEM COMMUNITY CENTER	750 Manger Avenue Bethlehem, GA 30620	1	7 am to 1 pm
				2	1 pm to 7 pm
BARROW	4	COVENANT LIFE SANCTUARY	115 Patrick Mill Rd SW Winder, GA 30680	1	7 am to 1 pm
				2	1 pm to 7 pm
BARROW	5	FIRE STATION 1 (STATHAM)	1625 Bethlehem Road Statham, GA 30666	1	7 am to 1 pm
				2	1 pm to 7 pm
				3	1 pm to 7 pm
BARROW	13	WINDER COMMUNITY CENTER	113 E. Athens Street Winder, GA 30680	1	7 am to 1 pm
				2	7 am to 1 pm
				3	1 pm to 7 pm
BARROW	16	THE CHURCH AT WINDER	546 Treadwell Road Bethlehem, GA 30620	1	7 am to 1 pm
				2	1 pm to 7 pm
CLARKE	1A	WINTERVILLE TRAIN DEPOT	125 NORTH CHURCH ST., WINTERVILLE GA 30683	1	1 pm to 7 pm
				2	7 am to 1 pm
CLARKE	1D	WHIT DAVIS ELEMENTARY SCHOOL	1450 WHIT DAVIS RD., ATHENS GA 30605	1	1 pm to 7 pm
				2	7 am to 1 pm
CLARKE	2A	JUDIA J. HARRIS ELEM. SCHOOL	2300 DANIELSVILLE RD., ATHENS GA 30601	1	1 pm to 7 pm
				2	7 am to 1 pm
				3	1 pm to 7 pm
				4	7 am to 1 pm
CLARKE	3B	THOMAS N. LAY PARK	297 HOYT ST., ATHENS GA 30601	1	7 am to 1 pm
CLARKE	4A	ATHENS TRANSIT MULTI-MODAL CTR	775 E BROAD ST., ATHENS GA 30601	1	7 am to 1 pm
				2	1 pm to 7 pm
CLARKE	4B	MEMORIAL PARK	293 GRAN ELLEN DR., ATHENS GA 30606	1	7 am to 1 pm
				2	12 to 6 pm
CLARKE	5A	OGLETHORPE AVENUE ELEMENTARY SCHOOL	1150 OGLETHORPE AVE., ATHENS GA 30606	1	7 am to 1 pm
				2	1 pm to 7 pm
CLARKE	5B	WHITEHEAD RD ELEM SCHOOL	555 QUALWOOD DR., ATHENS GA 30606	1	7 am to 1 1:30
				2	7 am to 1 pm
				3	1 pm to 7 pm
				4	1 pm to 7 pm
CLARKE	5D	ACC FLEET MGMNT BLDG	225 NEWTON BRIDGE RD., ATHENS GA 30607	1	7 am to 1 pm
				2	7 am to 1 pm
				3	1 pm to 7 pm
CLARKE	6A	CLEVELAND RD ELEM SCH	1700 CLEVELAND RD., BOGART GA 30622	1	7 am to 1 pm
				2	1 pm to 7 pm
CLARKE	6C	TIMOTHY RD ELEM SCHL	1900 TIMOTHY RD., ATHENS GA 30606	1	1 pm to 7 pm
CLARKE	7A	UNITARIAN UNIVERSALIST FELLOWSHIP	780 TIMOTHY RD., ATHENS GA 30606	1	1 pm to 7 pm
CLARKE	7B	ATHENS REGIONAL LIBRARY	2025 BAXTER ST., ATHENS GA 30606	1	7 am to 1 pm
				2	1 pm to 7 pm

County	Precinct ID	Polling Place	Address	Observer	Shift
CLARKE	7C	FIRESTATION #3	1198 SOUTH MILLEDGE AVE., ATHENS GA 30605	1	7 am to 1 pm
				2	1 pm to 7 pm
CLARKE	8A	GAINES ELEMENTARY SCHOOL	280 GAINES SCHOOL RD., ATHENS GA 30605	1	1 pm to 7 pm
CLARKE	8B	CEDAR SHOALS HIGH SCHOOL	1300 CEDAR SHOALS DR., ATHENS GA 30605	1	7 am to 1 pm
				2	1 pm to 7 pm
CLARKE	8C	FIRESTATION #7	2350 BARNETT SHOALS RD., ATHENS GA 30605	1	7 am to 1 pm
				2	1 pm to 7 pm
JACKSON	3 (Central Jackson)	HOPE CROSSINGS CHURCH	2106 Old Pendergrass Rd, Jefferson, GA 30549	1	7 am to 1 pm
				2	7 am to 1 pm
				3	1 pm to 7 pm
MADISON	Danielsville	MADISON COUNTY BOARD OF ELECTIONS	94 Spring Lake Drive Danielsville, GA 30633	1	1 pm to 7 pm
				2	7 am to 1 pm
MADISON	Hull	HULL COMMUNITY CENTER	1346 Old Elberton Rd Hull, GA 30646	1	7 am to 1 pm
				2	1 pm to 7 pm
OCONEE	1	WATKINSVILLE CITY HALL	191 VFW Drive Watkinsville, GA 30677	1	1 pm to 7 pm
				2	7 am to 1 pm
OCONEE	9	BOGART COMMUNITY CENTER	141 East Thompson St. Bogart, GA 30622	1	1 pm to 7 pm
				2	7 am to 1 pm
OCONEE	12	OCONEE COUNTY CIVIC CENTER	2661 Hog Mountain Rd. Watkinsville, GA 30677	1	1 pm to 7 pm
				2	1 pm to 7 pm
				3	7 am to 1 pm2
OCONEE	4 & 5	BISHOP BAPTIST CHURCH	1110 Old Bishop Rd. Bishop, GA 30621	1	1 pm to 7 pm
				2	7 am to 1 pm
OCONEE	6 &7	GRACE FELLOWSHIP CHURCH	1120 Malcom Bridge Rd. Bogart, GA 30622	1	7 am to 1 pm
				2	1 pm to 7 pm
OGLETHORPE	Beaverdam	SONLIGHT BAPTIST CHURCH	1134 Hargrove Lake Road Colbert, Georgia 30628	1	7 am to 1 pm
				2	1 pm to 7 pm
OGLETHORPE	Crawford	CRAWFORD DEPOT	1158 Athens Road Crawford, Georgia 30630	1	7 am to 1 pm
GWINNETT	88	BETHANY BAPTIST CHURCH	2306 Bethany Church Road Snellville GA 30039	1	7 am to 1 pm
GWINNETT	59	LANDMARK CHURCH	3737 Holcomb Bridge Road Norcross GA 30092	1	1 pm to 7 pm
GWINNETT	57	B B HARRIS ELEM SCHOOL	3123 Claiborne Drive Duluth GA 30096	1	1 pm to 7 pm
GWINNETT	123	IGL BAUTISTA NUEVA JERUSALEN	5300 Williams Road Norcross GA 30093	1	1 pm to 7 pm
GWINNETT	155	EPIPHANY LUTHERAN CHURCH	1350 Peachtree Industrial Blvd Suwanee GA 30024	1	1 pm to 7 pm
GWINNETT	51	IGLESIA METROPOLITANA SDA CHURCH	5990 Oakbrook Parkway Norcross GA 30093	1	7 am to 1 pm
GWINNETT	119	KNIGHT ELEMENTARY	401 North River Dr Lilburn GA 30047	1	7 am to 1 pm